The following changes should be made though out chapter 23 to bring the following names and documents up to date:

Old	**Change to**
Middle Rio Grande Council of Governments	Mid-Region Council of Governments
Long Range Major Street Plan (LRMSP)	Long Range Roadway System Plan (LRRSP)
Bikeways Master Plan (BMP)	Long Range Bikeway System Plan (LRBSP)

The legend for the Amendments are as follows:

New Text ---------- New Text

Deleted Text ---------- ~~Deleted Text~~

Updated Text ---------- Updated Text

SECTION 3. ENGINEERING DESIGN CRITERIA

G. Parking Area Dimensions and Required Improvements

1. Parking space dimensions shall be 8.5 feet by 20 feet. (min.)
2. If the premises contains more than 20, spaces one fourth may be 7.5 feet by 15 feet (small car). (Permitted vehicle overhang 2 feet for standard stall, 1.5 feet for small car, on private property only)
3. Parking for the physically disabled shall ~~be 12 feet by 20 feet or 8.5 feet by 20 feet if an additional delineated access aisle 3.5 feet on one side is provided. Two such spaces may share this aisle. Slopes disabled parking spaces and aisles shall not exceed 5%.~~ be constructed in accordance per the requirements of the uniform building code or other applicable regulations. Refer to the City of Albuquerque Building permit section.
4. Parking areas shall be paved ~~with a minimum 2 inches asphaltic concrete or equal.~~ per the City Zoning requirements.
5. Parking areas shall have barriers which prevent vehicles from extending over public sidewalk, public right of way or abutting lots.
6. The required landscaping plan must be reviewed by the Traffic Engineer to insure that traffic safety needs are met.
7. The number parking spaces required, number of handicap spaces and landscaping requirements are contained in Section 40 of the City Zoning Code.

Table 23.3.3
STANDARD CURB RETURN RADII (AT FLOWLINE)
AND RIGHT-OF-WAY AT INTERSECTIONS

INTERSECTING STREETS	PRINCIPAL ARTERIAL	MINOR ARTERIAL	COLLECTOR	MAJOR LOCAL	LOCAL RESIDENTIAL	LOCAL INDUSTRIAL COMMERCIAL
PRINCIPAL ARTERIAL	(3) MIN.*	~~(3)*~~ 35'*	~~(3)*~~35*	30'	30'	30'*
MINOR ARTERIAL	~~(3)*~~35'*	35'*	30'*	30'	30'	30'*
COLLECTOR	~~(3)*~~ 35'*	30'*	25'	25'	25'	30'*
MAJOR LOCAL	30'	30'	25'	20'	20'	30'*
LOCAL RESIDENTIAL	30'	30'	25'	20'	20'	N/A
LOCAL-INDUSTRIAL COMMERCIAL	30'*	30'*	30'	30'	N/A	30'*

ALLEY RETURNS	Shall match the radii requirements for design vehicles expected 25' minimum

*MAY BE INCREASED OR DECREASED AT DISCRETION OF THE TRAFFIC ENGINEER.

NOTES:

~~1.~~ Radii needs to be evaluated in terms of design vehicle where significant percentages of WB-40, 50, and 60 vehicles are probable. 2- centered or 3-centered curves should be used to provide turning paths.

~~2~~.1. Intersecting property lines at intersections must be designed to allow construction of full-sized standard handicapped access ramps wholly within the public right-of-way. Ramps must conform to the Standard Details.

~~3.~~2 Flared transitions must be provided where local residential streets having less than 32 feet wide paving intersect other streets. The transition must provide for a 1 25:1 taper from the narrower street width to a full 32 feet pavement width at the ends of the curb returns on the narrow street leg of the intersection. Curb return radii will normally be 25 feet measured to the flowline.

~~4.~~3. Use three centered asymmetric curves with channelized right-turn lane. Island shall be large enough for pedestrian facilities and Traffic Control devices. ~~See Figure 23.3.1 for details.~~ A 180'-60'-300' three centered curve should be used. Contact the Traffic engineer for details.

~~Click to view:~~

~~Figure 23.3.1 – Channelized Right Turn for Intersection with Principal Arterial~~

SECTION 4. STRUCTRURAL DESIGN OF PAVEMENTS

A. Flexible Pavements for Arterial, Collector, and Industrial streets

TABLE 23.4.3 TRAFFIC DESIGN CRITERIA

Street Classification	Current AWDT per lane	Truck Traffic (percent) SUT	STT	MTT	BUS	Directional Distribution (percent)	Annual Growth Rate (percent)
Principal Arterial	6000	3	1	1	*	50	5
Minor Arterial	4250	3	1	1	*	50	4
Collector	3000	3	1	1	*	50	4

* contact the transit department.

SUT - Single Unit Truck
STT - Single Trailer Truck
MTT - Multi-Trailer Truck

The calculation of the default ESAL (Equivalent Single Axle Loads) is as follows:
ESAL = Current AWDT * 365 * Growth Factor * (%SUT * Eq.F.SUT + %STT * Eq.F.STT + %MTT * Eq.F.MTT + %Bus * Eq.F.BUS + %Auto * Eq.F.Auto)
Where:Eq.F. for various vehicle types is shown in Table 23.4.5

b. Analysis Period

The analysis period for design shall be 20 years and the classification of streets are obtained from the Long Range Roadway System Plan (most current plan).

c. Design Lane Traffic Computation

The following equation will determine the traffic (WL) in the design lane:
WL = Dd * Dl * W18
Where: Dd = A directional distribution factor, expressed as a percentage, that accounts for the distribution of ESAL units by direction but not less than Table 23.4.3.

Dl = A lane distribution factor, expressed as a percentage, that accounts for distribution of traffic when two or more lanes are available in one direction (Table 23.4.4).
W18 = The cumulative two-directional 18-kip ESAL units predicted for a specific section of roadway for the analysis period.

TABLE 23.4.8 STRUCTURAL COEFFICIENTS OF PAVEMENT COMPONENTS

Component	Coefficient/Inch
Plant Mix Seal Coat (PMSC)	.25
Asphaltic Concrete (AC)	.42
Bituminous Treated Base Course (BTB)	.25
Cement Treated Base Course (CTB)	.20
Aggregate Base Course (ABC)	.10
Sub-base Material	~~.~~08 0
Asphalt Emulsion Treated Soil	Tentative
Soil Cement	Tentative
Lime Stabilization	Tentative

c. Regional Factor

A regional factor of 2.0 shall be used for the City of Albuquerque.

d. Serviceability Index

The serviceability of a pavement is defined as the ability to serve high-volume automobile and truck traffic. In the design equation, the serviceability index enters into the equation as the lowest index that will be tolerated before resurfacing or reconstruction becomes necessary.

A scale with a range of 0 through 5 was established for present serviceability rating, with a value of 5 as the highest index of serviceability and 0 as the lowest. Albuquerque uses a serviceability index of 2.5 for major streets.

FIGURE 23.4.3 - STRUCTURAL DESIGN COMPUTATION FORM

PROJECT NAME: STREET:					SHEET NO.	OF	
PROJECT NO: FROM:			TO:				
DESIGN ADL:							
DESIGN SN: COMPUTED BY:							
Alternate	Subbase	CTB	BTB	ABC	AC	PMSC	SN
	x(.~~08~~) 0=	x(.2)=	x(.25)=	x(.1)=	x(.42)=	x(.25)=	
A							
B							
C							
D							
E							
F							

Design SN =

B. Flexible Pavements for Local Streets

Pavement structure designs for local streets serving residential areas have been standardized and are presented in the Standard Details. These designs are also predicated on an assumed subgrade bearing value of 50 or greater (as specified in the Standard Specifications). Soils investigation as outlined in the materials evaluation section, preceding will be required to determine the nature of subgrade treatment needed to achieve the minimum subgrade bearing values.

NOTE: In accord with Environmental Planning Commission Resolution of April 5, 1979, the criteria in this section apply to private streets.

C. Portland Cement Concrete Streets

The current acceptable method for design of portland cement concrete pavement is the procedure in the AASHTO interim guide for design of pavement structures, 1972, published by the American Association of State Highway and Transportation officials, Washington D.C.

Design criteria to be used in the structural design of Portland Cement concrete pavement are as follows:

1. All Portland Cement concrete pavements shall be fly-ash modified concrete as specified in the Standard Specifications.

2. Design shall be based on flexural strength value of 600 p.s.i. at 28 days as measured by ASTM Method C 78.

3. Stabilized base course values used in conjunction with Portland Cement concrete pavement designs shall be the same as indicated below:

Portland Cement Related Base - 300 psi compressive strength as measured by ASTM Method D1633. Asphalt Treated Base - 1000 pound minimum Marshal stability as measured by ASTM Method D1559 (as modified in the Standard Specifications)

Section 5. Miscellaneous Street Design Criteria

D. Cul-de-Sac, Stub, Loop and Special Design Street Criteria

TABLE 23.5.1
MAXIMUM CUL-DE-SAC LENGTH - SINGLE-FAMILY RESIDENTIAL STREETS

Lot Width	Maximum Cul-de-Sac Length
less than or equal to 60'	700'
greater than 60', less than or equal to 75'	800'
greater than 75', less than or equal to 90'	900'
greater than 90 ~~100'~~	1000'

2. Maximum number of dwelling units allowed to be served by a cul-de-sac is 50 unless otherwise specifically approved by the Traffic Engineer.

3. The maximum length permitted in a cul-de-sac for other local streets is shown in Table 23.5.2 and is measured as 1. above. In addition, the acceptability of cul-de-sacs as a single access needs to be evaluated as in section 23.5.E.7.

Section 7.PARKING AREA AND DRIVE THROUGH FACILITY CRITERIA

The City Zoning Code requires the design of access and circulation for parking areas and drive through facilities to be satisfactory to the Traffic Engineer. The design of these parking areas is a melding of a number of objectives of a development including safety, efficiency, aesthetics, etc. From a vehicular transportation point of view, one of the most critical areas of concern is the location and manner of access from the adjacent street. Section 6 should be consulted regarding the location and design standards for access points. The interface of the development adjacent to these areas also play a major role in how safely and efficiently they operate.

These guidelines for the layout of the parking areas represent engineering design standards which will result in good operational and safety characteristics. However, with the many variables in design and unique characteristics that can be encountered, the designer may need to investigate other ways of providing these desirable operational and safety characteristics. Prior to embarking on a design for these unusual conditions, the designer should contact the Traffic Engineer to reach agreement on the modifications to these guidelines.

A. Parking Stall Sizes

Parking stalls are required by the Zoning Code to be 8.5 feet wide and 20 feet long with a provision that if the premises contains more than 20 spaces, then one fourth of the spaces may be for small cars with dimensions of 7.5 feet wide and 20 feet long. Parking for the disabled shall be ~~12 feet wide by 20 feet long or 8.5 feet wide with an adjacent 3.5 delineated access aisle. Two adjacent spaces for the disabled may share the same access aisle.~~ provided in accordance with the City Zoning Code, or other applicable requirements. Overhang areas are 2 feet for normal size spaces and 1.5 feet for small car spaces (Distance from wheel stop to the front of the parking stall). Vehicles may not overhang public right-of-way.

D. Grading

Maximum grades should not exceed 8% in parking areas. For major circulation aisles and adjacent to major pedestrian entrances, the grades should be kept to 6% or less. Handicap access to buildings need to be maintained. ~~Areas designated for handicap parking need to be 5% or less gradient. Handicap ramps, with a slope of 12:1 or less, must be provided where curbs intersect the pedestrian access to buildings. These should be constructed with concrete or other suitable material which will provide an easily maintained, reliable path for handicapped individuals. Handicap ramps should not be constructed where they would protrude into a driving aisle. In these circumstances a depression in the sidewalk area should be provided in accordance with the City's Standard Details for construction.~~ Contact City Zoning for details.

E. Drive-Through Facilities

The layout of drive through facilities needs to take into account the queuing characteristics of the facility that is being designed. The integration of the drive through into the overall site should be such that queuing will not interfere with either the entry/exit to the site or with parking and circulation aisles.

Typical queuing lengths that must be provided for drive through facilities are as follows:

- Banks - 6 vehicles per window (120 ft)
- Fast food restaurants - 5 vehicles (100 ft)
- Other uses - the number of vehicles that should be designed for will be based upon the expected queue- check with Traffic Engineer.

Minimum lane widths are 12 feet minimum with a 25 foot minimum radius (inside edge) for all turns. (A 15 foot radius can be used with an increase in lane width to 14 feet).

Section 8.TRAFFIC IMPACT STUDIES

Note: This section ~~is a preliminary document outlining~~ outlines the basic warranting criteria, review process and format for traffic impact studies. ~~Much of this material is under review possible revision and further development.~~ Much of this material is provided as general guidance. Site specific circumstances may mandate more or less study requirements.

A. Warranting Criteria

1. Determination must be made whether a Traffic Impact Study (TIS) is required to be submitted with applications for rezoning, subdivision, sector plan, site development plan, building permit based upon traffic generation.

2. Site generated traffic of 100 or more additional (new) peak direction, inbound or outbound vehicle trips to or from the site in the morning or evening peak period of the adjacent roadways or the developments peak hour.

B. Report Preparation and Review

1. Traffic Impact Study Review Task Force

Once the determination is made that a Traffic Impact Study is required, a scoping meeting with the Traffic Engineer and the TIS Task Force needs to be scheduled. As identified in the recommendations for traffic impact study review, a review task force will be established from affected City staff to scope and review any required traffic impact studies.

2. Steps in report preparation and review (in order):

- Scoping letter for TIS including turning movement counts for signalized intersections and signal timing data as provided by City staff.

- Prepare draft TIS for review in accordance with prescribed format and scoping letter utilizing the most current edition or reference material and the latest version of analysis software.
- Submit draft TIS
- Staff comments provided for necessary revisions to produce final report
- Submit final report

C. Report Format

1. Introduction and Summary

a. Study Purpose

A general statement describing the intent of the report, and the reason it is being submitted (e.g., in support of a zoning change request, site plan, etc.).

b. Study Procedures

(1) Information sources

(2) Service levels to be provided - The minimum standard level of service shall be LOS D on roadway elements where the level of service is controlled by traffic control devices, e.g., signalized or stop controlled intersections. For intersections, this applies for each approach and each traffic movement. For arterial roadway segments where the level of service is not controlled by traffic control devices, the minimum standard level of service shall be LOS ~~C.~~ D.

(3) Scope of considerations (e.g., influence area and time frame) - The influence area is the area encompassing the roadway elements that are assumed to be impacted by the proposed development, and will be included in the impact study. The influence area will be defined by the City of Albuquerque Traffic Impact Study Task Force in the initial scoping meeting with the study preparer.

c. Executive Summary (as required)

(To be submitted under a separate cover)

(1) Site Location and Study Area

(2) Development Description

(3) Principal Findings

(4) Conclusions

(5) Recommendations

2. Existing Metropolitan Area Characteristics

This characterization should represent current conditions and should generally be no more than one year old. This information should include the following:

a. General Area Characteristics

(1) Location within the urban area (vicinity map).

(2) General land use development adjacent to the site.

(3) Existing zoning at the site and for adjacent lands.

(4) Site accessibility - A general plan depicting the existing and proposed access locations.

(5) Other planned and approved developments - A description of the location and type of other planned and approved developments in the influence area.

b. Area Street Network

A detailed description of the street network in the influence area which includes all of the geometric elements necessary for capacity analysis.

c. Existing Traffic Volumes

For all arterials and collectors in the influence area. Existing traffic volumes will be provided with the initial scoping letter for existing signalized intersection. For intersections where existing traffic counts are not available, the applicant will count the intersections in accordance with NMSH&TD standards.

d. Existing Levels of Service

For all roadway elements in the influence area, including site access facilities. The existing levels of service will generally be provided by City staff.

e. Existing Transit Service

3. Proposed Site Traffic Characteristics

a. Development Characteristics

- The development characteristics must include the following:
- An estimate of implementation phasing of the proposed development, to include the location and estimated date of occupancy of each phase.
- The specific type of land use to be implemented in each project phase, for example, gas station, hotel, residential dwelling units, etc., and the intensity of land use (e.g., square feet of floor space, number of dwelling units, etc.). The land use type and intensity should be expressed in the same terms as indicated in the ITE Trip Generation Manual for a given land use type.
- Proposed access locations for each project phase, indicated on a drawing of the highway network and showing approximate distances to existing or proposed signalized intersections on the adjacent roadway system.

b. Trip Generation Rates

For the proposed development, and other planned developments in the influence area (data for other planned developments shall be taken from previous impact studies as appropriate). The source of trip generation rates shall be the current edition of Trip Generation, published by the Institute of Transportation Engineers (ITE). Other trip generation rates that are deemed to represent local conditions may be used as prescribed by the City staff, or as suggested by the study preparer and agreed to by City staff. In the latter case, however, the burden of justifying the validity and use of trip rates other than those in the ITE Manual is on the study preparer.

c. Trip Generation

For the proposed development and the other planned developments in the influence area (data for other planned developments shall be taken from previous impact studies as available). Assumptions regarding the types of trips must be clearly stated, and discussed with City staff at the initial coordination meeting.

d. Metropolitan Trip Distributions

The directional distribution of traffic accessing and egressing the study site. This distribution is to be ~~provided by City Public Works Department staff.~~ determined using the most recent edition of the Mid-Region Council of Governments (MRCOG) socioeconomic forecasts document.

e. Traffic Assignment

The assignment of trips entering and exiting the study site. These assignments will generally be required for both morning and evening peak hour condition.

4. Future Traffic Conditions and Analysis Years

a. Project Implementation Year

Traffic forecasts shall be developed for the year the development is to be completed. A project implementation year analysis must be performed for every project, or for each phase of a project, that satisfies the traffic impact study warrant criteria. It is recognized that a projection of current trends may not always be reasonable based on the existing roadway level of service, location and degree of land development. Therefore, transportation system improvements in the study area that are programmed, committed or highly likely to occur during the forecast period should be included in the analysis.

If the implementation of the proposed development is to be phased in over several years, analyses will be required for the implementation date of each phase where the criteria for performing a traffic impact study is met, or as directed by City Public Works Department staff. Traffic volumes must be determined which will account for three conditions:

(1) Growth in through traffic - Through traffic can be estimated using growth factors based on the most recent ~~three~~ five years of historical volume data. The use of growth factors is most appropriate for development periods of five years or less. Beyond a five year period growth rates should be reviewed with respect to reasonableness in comparison to roadway capacity limitations, and the long-range traffic forecast from the MRGCOG regional forecast model.

(2) Other planned development - Other, off-site development which is to occur prior to the project implementation year must be accounted for, and the traffic associated with this development included in the analysis. Where previous impact studies have been produced, the traffic results should be incorporated into the analysis. For sites without impact studies, trip generation, distribution, and assignment should be based on an estimate of the "most likely" land use. The sum of the

through traffic and the traffic generated by off-site development in the study area represents the background traffic for the implementation year analysis.

(3) Site traffic - This is the implementation year traffic attributable to the site development. The site traffic plus the background traffic represents the total traffic on the study area roadway system.

~~b. Horizon Year~~

~~Typically this is the long-range planning year used by MRGCOG (usually 20 years). This analysis compares the estimated influence area traffic, including the proposed development to the long-range forecast traffic from the influence area. Traffic volumes for the horizon year will be provided by the City. Adjustments to these volumes may be necessary to account for any difference between the trip-generating characteristics of the subject project, and assumptions made in the traffic forecasting procedure which relate to the study area. This analysis should include all roadway system improvements planned for the horizon year.~~

~~Developments of small size (e.g., less than 500 peak inbound or outbound hour trips generated) may not require a horizon year analysis. This determination should be made by City staff at the initial project scoping meeting.~~

5. Traffic Analysis

a. Intersection and Roadway Analyses

(1) Identified intersections and roadways to be studied (includes site access and egress points).

(2) Identify typical signal timing for existing signalized intersections.

(3) Calculate intersection and roadway capacity and LOS for morning and afternoon peak periods under the following conditions:

(a) Existing traffic (may be given by City Public Works Department staff)

(b) Project implementation year (includes other planned developments)

(i) without proposed development (background traffic only)

(ii) with proposed development (background plus site traffic)

~~b. Horizon year with proposed development~~

(4) The analysis shall include the programmed or planned elements of the highway system for the implementation ~~and horizon~~ year~~, respectively~~. The analysis of existing, or other warranted, signalized intersections shall be based on the operational/design procedures in the Highway Capacity Manual (HCM) (or equivalent as approved by City staff) for the project implementation year. The analysis of ~~horizon~~ implementation year may be performed using the planning or operational method as described in Chapter 9 of the HCM, as deemed appropriate by City Public Works Department staff. Analysis of unsignalized locations, including major access driveways shall be based on the methodology contained in Chapter 10 of the HCM.

c. Identify Alternative Intersection and Roadway Designs

Alternative configurations shall be proposed for each intersection and roadway which fails to maintain the standard levels of service in the implementation year when considering either of the following conditions:

(1) Background traffic only

(2) Background plus site traffic

General description of roadway and intersection improvements are required for the horizon year, as deemed appropriate by City Public Works Department staff.

d. Evaluate Alternative Intersection and Roadway Designs

The capacity and level of service of each of the alternative intersection and roadway design shall be determined using the operational/design procedures of the 1985 HCM for the implementation year. Intersection analysis may be performed for the horizon year using the planning or operational methods of the 1985 HCM, as deemed appropriate by City Public Works Department staff.

e. Perform Signalization and Stop Sign Warrant Analyses

All locations meeting signal and stop sign warrants based on traffic volume in the implementation year should be identified. If an intersection is found to meet signal warrants based on the criteria contained in the Manual on Uniform Traffic Control Devices (MUTCD) in the project implementation year, a signalized intersection operational analysis shall be performed using the procedures contained in the HCM. If the signal warrants are met in the horizon year, a planning level analysis shall be conducted according to the procedures described in the HCM. Recommendations for signal installation should be made as signal warrants are met. Upon review of the recommendations contained in the Traffic Impact Study, the Traffic Engineer will make a determination of whether the signal should be installed and/or provisions made for future signal installation. This determination shall be included in the final copy of the Traffic Impact Study.

f. Site Circulation and Parking

An assessment shall be provided of the on-site circulation system and parking requirements, queuing needs, and access lane requirements.

6. Site Access Requirements

A description of the improvements needed to meet design and operational standards both on and off site.

a. Site Access/Circulation Plan
b Roadway Improvements
(1) On-site
(2) Off-site
(3) Implementation Phasing
c. Transportation System Management Actions
d. Other

7. Conclusions

A summary of the report which highlights changes in intersection or street configurations necessary to meet design and operation standards.

8. Appendix
a. Support Data for Analyses
b. Capacity Analysis Worksheets

9. Off-site mitigation recommendations for the subject site.